The Electric Fluid *and the* Search for Materiality: Visions *of* Energy *and* Technology in *the* Advertising *of the* First Electric Lights. Santiago, Chile. 1900-1920.

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ABSTRACT

This article analyzes the historical evolution of the different visions in regards to electric lighting, which were materialized on first published advertisements in Santiago, Chile (1900 - 1920). These visions coincided with the search for explanations on the materiality of electricity by the State and municipal authorities and the incipient engineering technocracy, which tended to define this energy as a 'fluid'. Likewise, the electricity companies took this discourse and used it in advertising, highlighting the properties of this energy matrix and its technical supremacy over other types of lighting, giving it symbolisms associated to the reduction of energy consumption and 'vitamin' potentials. From an STS theoretical approach, the advertising of electric lighting is studied in its first stage of expansion in Santiago, a period in which it was confronted by different types of lighting. For this purpose, the advertising ads published in the *Zig-Zag* magazine and the newspaper *El Ferrocarril*, as well as the minutes of the Bulletin of the Municipality of Santiago and the Chilean Institute of Engineers, were used as sources. Along with these and in search of a comparative regional analysis, other Latin American cases are also introduced.

Keywords:
Electricity
Technology
Advertising
End of the 20th century
Santiago, Chile

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'Lightning is selling' was the advertising tagline used by the Compañía General de Electricidad (General Electricity Company) in Santiago during a January night in 1929 (Figure 1). This message, made up of a succession of electric bulbs, introduces us to one of the most important technological, urban, and cultural processes that the city underwent as of the turn of the century: the arrival and expansion of electric lighting. In this process, the advertising of the first electric lighting showed a series of representations about energy, such as its connection with medical hygiene, its implication in urban development, industrial reasoning, and its economic aspects (Álvarez Caselli, 2011; Bouman, 1987; Hughes, 1983; Levy, 1997; Nye, 2019; Palmarola Sagredo, 2010; Rose & Clark, 1979; Schivelbusch, 1988).

The development of electric lighting in Santiago, as in other cities in Latin America, was part of the international capitalist scene of the late 19th and early 20th centuries (Tafunell, 2011; Yáñez, 2017). A clear example

Figure 1: 'Lighting is selling.' Photograph: Chilectra Metropolitana S.A. (January 12, 1929). Source: Archivo Histórico ENEL, Álbum Fotográfico. Available at Biblioteca Nacional Digital de Chile http://www.bibliotecanacionaldigital.gob.cl/visor/BND:554234 (p. 11).

thereof is the arrival of German and American companies related to energy production, which were responsible for generating, distributing, and encouraging the use of electrical appliances, in addition to producing, transmitting, and distributing energy in the city (Álvarez Caselli, 2011; Nazer et al., 2005; Prudant, 2018). To this end, such companies projected, through advertising, the need to acquire electric lighting, embodying a series of positive visions associated to it. Thus, as pointed out in Zig-*Zag* magazine in 1919 ("Publicidad", 1919), electric light would cease to be a luxury and would eventually become a necessity.[1]

These visions of electricity coincided with the explanations about its materiality offered by state and municipal authorities and the incipient engineering technocracy – grouped in the Institute of Engineers of Chile, better known as IICH –, which tended to define this energy matrix as a non-dangerous force that did not infringe upon people's lives. In the specific case of the advertising of electric lighting, the companies shared this technical discourse and used it as a mechanism of advertising dissemination, constantly appealing to the properties of electric light over other types of lighting of the time.

Accordingly, for this article, the notion of 'fluidity' will be used as a common thread, in order to investigate the historical evolution of the positive visions given to energy and electric lighting through their first advertisements in Santiago. Specifically, an inquiry is made on those advertising messages that sought to give materiality to an energy that was extremely difficult to describe and represent at that time. In this way, and from the theoretical approach of Science and Technology Studies (STS), the historical process of electrification is presented in its first state of expansion as a technical device in the city, where it competed with products of a longer history, such as gas and kerosene lightning, on process that has been called 'technical confrontation' (Latour, 2008; Schivelbusch, 1988).[2]

In order to build on this premise, more than 350 advertisements for electric, gas, and kerosene lighting devices that appeared in the *Zig-Zag* magazine between 1905 and 1920 were collected and analyzed from a qualitative methodological perspective.[3] From this total, due to the extension of this article and prioritizing a narrative approach that accounts for the process and evolution of visions on electric energy, 13 images were selected. Complementing this work, advertising images of electric, gas, and kerosene appliances published in the newspaper *El Ferrocarril* were registered. Moreover, with the purpose of integrating the political thinking of local authorities, the Bulletin of the Municipality of Santiago between 1890 and 1910 was added to the investigation. Likewise, to complement the study with the technical-engi-

1 From a theoretical point of view, the concept of 'visions' is used as 'representational discourses', following the contributions, arising from the cultural history of Roger Chartier (1992). This analysis is completed with the work of architectural historian Davide Deriu (2001), to whom it is necessary to study urban representations in the configuration of spaces (such as electrification).

2 For Latour (2008), technical confrontation is one of the first methodological steps of the Actor-network Theory, where, for its realization, socio-technical controversies must be applied. That is, confronting more than one disputed technology to understand its developments in each social group. For Schivelbusch (1988), technical confrontation is also a juxtaposition, where the impact of new technologies must be studied with respect to older ones, given that technological processes are not linear and must be analyzed in a much broader temporal perspective.

3 A total of 1,007 issues of *Zig-Zag* were reviewed. The qualitative work focused on the images of advertisements. A total of 379 advertisements were consulted, of which 249 corresponded to electric lighting, 90 to kerosene, and 38 to gas.

neering discourse of the time, the revision of the IICH Acts elaborated between 1890 and 1910 was annexed.[4]

Finally, this article seeks to connect the historical process of electric lighting with the theoretical contributions of the history of urban technologies, which follow the creation and expansion of technical infrastructures in cities, mainly through the study of the extensions of basic services and their advertising messages (McShane, 1979; Meisner Rosen & Tarr, 1994; Melosi, 2010; Schivelbusch, 2005; Stine & Tarr, 1998; Tarr, 2002; Tarr & Lamperes, 1981). In this last aspect, the advertising of the first electrical devices is presented as a historical source, describing how the electric lighting process raises a series of dilemmas associated to the lack of a consistent discourse in its first extension phase in Santiago (Álvarez Caselli, 2011; Dussaillant-Christie, 2019).[5]

ELECTRICAL FLUIDITY VERSUS GAS AND KEROSENE LIGHTING

The electric companies in Santiago conveyed the benefits of this energy through their advertising, using as one of their main messages the technical difference with kerosene and gas lighting. To exemplify this juxtaposition, I introduce a concept associated with electricity in Latin America at the end of the 19th century, such as fluidity, mainly considering it as non-palpable physical energy, impossible to touch or see.[6] On this concept, I will later delve into the advertising messages of gas and kerosene lighting versus electric lighting in Santiago.

In Mexico, during the Porfiriato, electricity was compared to "that invisible fluid [which] is light, force, heat, word, and useful to industry, science, and war" (Briseño Senosiain, 2006, pp. 205-206). In Argentina, the inception of electricity as a fluid can be traced back to the educational treatises used by the State for teaching in schools such as the *Física general* by Bahia and Ganot's *Tratado elemental de física*, from 1885 (Liernur & Silvestri, 1993). In these texts, the complexity of describing electricity as fluidity lay in how to achieve an explanation about an invisible energy source, causing the installation of representations that mixed science, journalistic stories, and the para-scientific (Correa & Vallejo, 2019; Sarlo, 1997).

In the case of Santiago, the association of electricity with fluidity began during municipal and parliamentary discussions prompted by the introduction and development of the electric tram. In this technical insertion, the characteristics of horsecars, better known as *tranvías de sangre* (blood streetcars), were juxtaposed with the new electric means of transportation (McShane & Tarr, 2011). Thus, the so-called 'biologization of transport,' a concept associated to the presence of horses and their biological waste in the

4 In the case of the newspaper *El Ferrocarril*, the same qualitative approach was chosen, and a research of images published between July 1900 and January 1907 was carried out. To obtain information on political decisions at the local level, the Bulletin of the Municipality of Santiago between 1890 and 1910 was consulted and registered. The mentioned annals can be accessed online at https://revistas.uchile.cl/index.php/AICH/issue/archive

5 For historical studies of advertising as a source, see the introduction to the article by Jacqueline Dussaillant-Christie (2019). Additionally, we follow the work already cited by Pedro Álvarez Caselli, for whom "advertising also emerges as a good example of how to think about cultural dynamics in societies because it expresses a form of interrelation between the components of the economy of the cultural industry and, at the same time, it reflects the aesthetics, lifestyles, and ways of consuming that are generated in these exchanges" (2011, p. 114).

6 Following Charles Baudelaire, Marshall Berman uses the concept of 'fluidity' to exemplify the "primary qualities in the self-consciously modernist painting, architecture and design, music and literature, that will emerge at the end of the nineteenth century." (1988, p. 143). In this sense, fluidity was a concept used to describe the material and symbolic scenario of technological changes that took place with the introduction of gas and electric lighting in Parisian cafes in the late 19th century. Translator's note: For the quoted passage from Berman, the English edition was used (Penguin Books, 1988).

streets, gave way to a process of technologizing urban mobility in the hands of the electric tram (Booth, 2013; Errázuriz, 2010, 2012; Prudant, 2018, 2019; Zacarías, 2018). The installation of this transport was the material base on which the lighting and electrical substations that would later feed with energy the city would be built (Zacarías, in press).

Parallel to this change in transportation, the members of the Chilean Institute of Engineers (IICH) were reluctant to acknowledge electricity as 'a mysterious fluid' since this conception was typical of ignorant people and lacked a scientific basis. Through an incipient technical discourse, the engineers argued about the need to introduce electricity, seeking 'human progress,' taking advantage of the rivers of the central Chilean zone to produce hydroelectric energy and highlighting the positive characteristics of electricity as opposed to gas lighting (Zacarías, 2018). In such conception, it is seen how the use of electrical energy was assembled not only to a staging that sought to insert new lighting systems in the city but also to its industrial potentialities.[7] For engineers, as the electric companies would later highlight, electric lighting began to stand out not only for its benefits over gas and kerosene lighting, but also for its strong and practically natural association with economic progress (IICH, 1902).

7 This has also been studied in Argentina by Liernur and Silvestri (1993).

In material terms, it was important to engineers that electricity was odorless and did not produce suffocation or explosions, which was highlighted through comparisons with kerosene and gas lighting (IICH, 1902). A similar case occurred in Peru at the end of the 19th century, where gas lighting was questioned by medical authorities who reached the point of writing a thesis called 'The Insalubrity of Artificial Lighting' (Lossio, 2003, p. 71). In Chile, faced with competition from electric lighting in public spaces, gas lighting was being inserted in the upper-class residences of Santiago and Valparaíso, taking control of lighting in the domestic space from the beginning of the 20th century (Martland, 2002, 2017; Nazer, 1996). By 1906, the technical juxtaposition between different types of lighting was reflected in the language and symbolism used in advertising.[8]

8 For Hugo Palmarola S., in Santiago both gas and electricity were "key elements to the American commercial project of the energy business and Taylorist efficiency since the first decades of the 20th century" (2017, p. 165). For a study from a cultural history perspective of gas versus electric lighting, see Schivelbusch, 1988.

In Figure 2 we can see the advertising of the incandescent gas burner "Luz Block," by J. Tusche & Compañía. The "300-force plug" device is defined as 'powerful' and 'economical' and, in comparison, is described as much "brighter than electric light."

Two months after this add, *Zig-Zag* magazine would dedicate a full article to the *Compañía de Consumidores de Gas* (Gas Consumers Company), to which would be added the advertising of the *Compañía de Gas Acetileno* (Acetylene Gas Company). This last company introduced gas lighting in the houses of the elite of Santiago, such as the villas of Ricardo Fontecilla in Ñuñoa and

Pastor Fernández Concha in the Llano de Subercaseaux (today's Municipality of San Miguel).[9] After obtaining the first prize in the Agricultural Exhibition of Chillán in 1904, the *Compañía de Gas Acetileno* defined itself as the one with the recognition of having the best appliances available in Chile, as illustrated in one of its announcements (Figure 3).

In this technical juxtaposition of advertising messages, we should not only consider gas and electric lighting. As can be seen in the advertisement of the Belgian armory and lamp shop by John Seyler (Figure 4), kerosene lighting was advertised in contrast to gas and electric lighting, defining itself as a more inexpensive and odorless luminaire. That is to say, the explanation for kerosene lighting was based on its low price and lack of odor when using it.

This appeal to the odorless property of kerosene lighting was also exemplified in other technological appliances that used the same energy. In June 1907, the newspaper *El Ferrocarril* promoted the Casa Lumsden kerosene stoves as "very powerful and completely odorless" (Figure 5).

Quite the contrary to what these advertisements propose, and just as the technical discourse had expressed through the engineers' approach, the municipal authorities had a negative perception of gas and kerosene lighting, mainly due to its excessive smell and low light output (Zacarías, 2018). In addition to these perceptions, the inhabitants of Santiago's residential sectors submitted a series of requests to the Municipality to change said lighting in places such as the Museum of Fine Arts, the Parque Forestal, and the 10 de Julio Avenue (Municipalidad de Santiago, 1908). A relevant factor was added to this last point: the association of gas and kerosene lighting with the most vulnerable sectors of the population. In this sense, at the end of the 19th century, local authorities indicated that kerosene lighting was used in the 'populated neighborhoods' of Santiago (Municipalidad de Santiago, 1895). However, at the same time, the authorities approved the insertion of electricity through the electric tram in wealthy places close to their residences (Prudant, 2018; Zacarías, 2018).

It is appropriate to complement this aspect with another Latin American case for the same period. In Mexico, advertising around electric lighting not only evidenced the aspirations of the upper class regarding this energy, but it was also created by the electric companies so that the lower classes would want to obtain the benefits associated with such lighting. Thus, advertising on electric lighting sought to bring with it the acquisition of as much of this energy as possible, causing the demand for gas and kerosene to drop. This is what Lilian Briseño calls "an effect of the solidarity of progress," that is to say, the process in which companies publicized electric lighting

9 For a historical analysis on the insertion of gas lighting see Tarr, 2014.

Figure 2: Incandescent gas burner. Source: *Zig-Zag* magazine, January 21, 1906 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

Figure 3: "Fiat Lux." Advertising of the *Compañía de Gas Acetileno*. Source: *Zig-Zag* Magazine, September 17, 1905 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

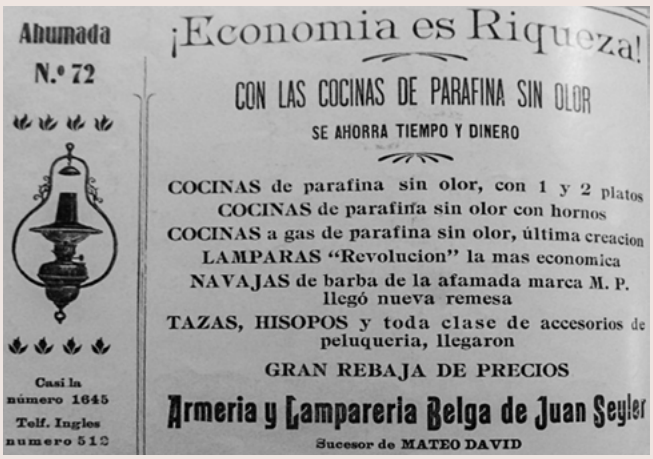

Figure 4: Advertisement of the Belgian armory and lamp shop of John Seyler. Source: *Zig-Zag* Magazine, July 15, 1906 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

Figure 5: Lumsden House Advertising. Source: *El Ferrocarril*, June 23, 1907 (taken from the inventory of the Hemeroteca Collection, Humanities Library, Pontificia Universidad Católica de Chile).

taking into consideration that the use of coal and kerosene could decrease, seeking to increase the amount of population that would use electricity (Briseño Senosiain, 2006).

In Santiago, advertising for gas and kerosene lighting devices focused on material distinctions with electricity, appealing to their properties and advantages. In these advertisements, a constant search to explain their functionality in a lighting technical juxtaposition to electrical energy was evident. If we connect this historical process with the theoretical contributions from STS studies, specifically those related to technical confrontation, we notice how the city struggled, in a first state of technical insertion, to describe what electricity was regarding its state of matter.[10] This can be tracked at multiple levels, both in the political decisions by which the tram and electric lighting spread out through the city, in the engineering technocracy, and in the advertising message itself.

This difficulty not only led to a competition between different types of lighting but also gave way, in the following decades, to a predominance of positive visions associated with electricity above technical aspects, as I will exemplify in the second section. These visions were related to the almost natural connection of electricity to the progress of Santiago, to a reduction in energy consumption, and a connection with medical hygienism through the use of electricity in the human body, as a kind of vitamin fluid (Bouman, 1987; Hughes, 1983; Levy, 1997; Nye, 2019; Rose & Clark, 1979; Schivelbusch, 1988).

ELECTRICITY, ECONOMY, AND VITAMIN

Between 1910 and 1920, advertising of electric bulbs increased significantly in *Zig-Zag* magazine. Among the most frequent were the German lamp Tántalo and the Dutch lamp Philips, which shared two characteristics to which they constantly made reference of in their advertisements: the association of electric lamps with the reduction of energy consumption and the mention of a series of positive concepts associated to energy, such as duration, economy, and resistance. These visions of electricity illustrated in advertisements were connected to the idea of progress around such energy, which was established by the technical-engineering discourse, the political authorities, and the electric companies themselves.

The message of reducing energy consumption can be seen in the advertisements of the Tántalo lamp. This publicity began a historical process that accompanied the development of electric lighting in Santiago and Chile throughout the 20th century, by associating the use of electric bulbs to the reduction of electricity bills. Manufactured by Siemens and marketed by the Chilean-German company Saavedra Benard y Cía., the Tántalo lamp – which

10 Besides the theoretical concept of technical confrontation associated with the Actor-network Theory and STS, another classic theoretical approach, the SCOT model (Social Construction of Technology), proposes an analysis of technical phenomena from a more sociological perspective, where the conceptual category of 'closure' or stabilization of technologies takes an important role (Bijker et al., 1987; Bijker & Law, 1992).

owes its name to the metal or tantalum of the filaments inside its bulbs – was advertised as a light bulb that "consumes 50 percent less than other lamps and has a much longer life" (Figure 6).

Just a year later, advertisements would continue to connect this product to the decrease in electricity consumption with the phrase "my electricity bill reduced by half" (Figure 7). This preponderance of economic discourse in advertisements is directly linked to the initial process of the extension of electric lightning throughout Santiago, already mentioned. The arrival and subsequent expansion of electricity in the city was mainly generated through private initiatives and local policies, with the State playing a rather secondary role (Zacarías, 2018). This led to a specific way of understanding electricity and its products linked to epoch-making, capitalist approaches, influencing energy production companies and those companies that later promoted the commercialization of electrical devices (Prudant, 2018, 2019). Even the first energy legislation in Santiago (Decreto Ley 252 De Instalaciones Eléctricas, 1925) established electricity regulation parameters mainly for private users.

These economic notions would continue to be manifested in the advertisements of the Philips light bulb. Commercialized in Chile by Morrison y Compañía, the light bulb was described as "the cheapest that can be obtained today due to its great economy in electric current consumption, and its great resistance," saving up to 75 percent (Figure 8). In the respective ad, the lamp stands out as "the most resistant," being held by a woman dressed in traditional Dutch clothes, alluding to the birthplace of the brand (Figure 8).

The second feature of electric lighting advertisements between 1910 and 1920 was the insertion of a series of positive visions in regards to energy. More specifically, the presence of a series of representations that sought to give a body, a kind of materiality, and a physical form to electricity, defining it as "a constant, bright, soft, and extremely powerful white light" (Figure 9). Likewise, advertisements tended to define electricity as "amazing, very white, admirable, and inexpensive" (Figure 10), as illustrated in the following images of the Philips lamp (Figures 9 and 10).

Philips' advertisements kept on associating electricity to phrases like "such a bright light" and a "great economy." To reinforce these ideas, the company opted to add a metaphor about the purity of energy to the advertisement by incorporating children playing with an electric light bulb (Figure 11). This advertising mechanism was also registered in the United States when, by trying to explain the use of electric switches using advertisements, the companies in charge of this energy subsequently infantilized the message. The insertion of childish content in the advertisements sought to

Figure 6: Tántalo lamp. Source: *Zig-Zag* Magazine, October 9, 1909 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

Figure 7: Tantal lamps. Source: *Zig-Zag* Magazine, January 8, 1910 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

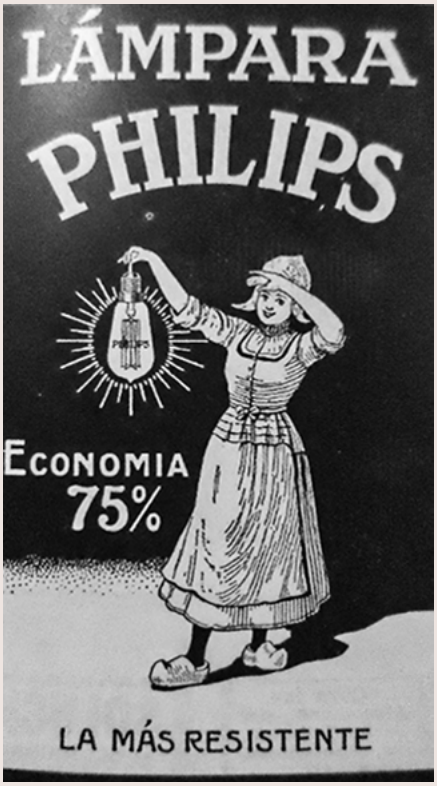

Figure 8: Advertising of the Philips Lamp. Source: *Zig-Zag* Magazine, December 9, 1911 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

make both electrical technology and its consumption easily understandable to the greatest number of people, together with the massification of an educational and also advertising discourse on how electricity worked and was used (Plotnick, 2012, 2018).

Another representation would be added to the visions of innocence and purity in the advertising messages for electric light bulbs: the electric light bulb as an "unbreakable" element (Figure 12). To do this, Philips used the human body as an advertising image, as can be seen in the advertisement for this device (Figure 12).

This increasingly frequent union of electric lighting and the human body in advertising also extended to the medicinal powers that energy could develop, a phenomenon better known at the time as "electrotherapy." This was exemplified in the advertisements for the use of Dr. Sanden's girdle (Figure 13), which appeared systematically in the magazine *Zig-Zag* and the newspaper *El Ferrocarril* between 1905 and 1915. These advertisements promoted a kind of electric belt that could be used at night to alleviate illness by emitting heat (Correa, 2014; Correa & Vallejo, 2019). This advertisement implied the knowledge of medical information, which was also presented at the IICH when, through studies on the use of electricity in the human body, it was indicated that victims of suffocation or gases could be revived (Actas IICH, 1895, 1902).

Figure 9: Philips electric bulbs. Source: *Zig-Zag* Magazine, November 11, 1916 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

Figure 10: Philips lamps. Source: *Zig-Zag* Magazine, September 2, 1916 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

Figure 11: Philips bulb. Source: *Zig-Zag* Magazine, October 26, 1918 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

What is relevant in these last advertisements is that they reaffirmed the almost natural assembly of electricity with the human body, making energy a positive and beneficial aspect for people's health. This idea, according to cultural and technology historian Wolfgang Schivelbusch, was the very foundation on which the notion of electric lighting as positive for the development of cities was built (Schivelbusch, 1988, 2005). By giving electricity a sense of cleanliness, purity, and innocence, among others already mentioned, energy was not associated to negative elements for the human body or urban environments. On the contrary, far from the notion of fluidity hindering the introduction of electric lighting, it made it to be considered a kind of necessary vitamin for the city and the population.

In this way, the idea of electricity as a vitamin fluid beneficial for the human body and cities, closely linked to the *fin de siècle* theories on body regeneration, is presented as a complement to this second section on the positive visions of electricity in advertising. As the 30s unfolded, the initial process of inserting electric lighting into advertising messages would lead to increasing development in the use of energy. Specifically, in illuminated signs, posters in electric trams, and large shop windows (Álvarez Caselli, 2011, pp. 43-44), as it appears in the advertising slogan that opens this article: 'Lighting is selling.'

In subsequent decades, electricity advertising would begin to focus on a specific functionality for each type of appliance, a process derived from a global background of insertion of electrical appliances in private spaces by large international electric companies,[11] added to a national scenario of State technical discourse on the industrialization of energy, crystallized through the new electricity plan to be carried out in Chile after the earthquake of 1939 in Chillán and that would continue until the mid-20th century (Zacarías, 2018).

CONCLUSIONS

Throughout this article, I have analyzed the development of the first electric lighting advertisements in Santiago. Between the 1890s and 1910s, the electrical 'fluid' faced the potentialities of kerosene and gas lighting, showing a difficulty to describe electricity in advertising due to its initial context of development in the city. This conflict of representation led to the fact that, in the 1910s and 1920s, electric lighting began to be associated in advertising with a series of material and symbolic benefits. Among them: the use of light bulbs to reduce energy consumption, its resistance, and the use of electricity in the human body, thus naturalizing its insertion in Santiago by presenting it as a kind of 'vitamin.' For the study of this process, and as a conclusion, it is worth highlighting three issues.

11 Pedro Álvarez Caselli calls this process 'domestic production strategies,' in which "it is proposed to address the symbolic processes and domestic production strategies associated with the modernizing phenomenon of urban life, typical of the 20th century, as well as the changes experienced in the field of lifestyles and sociabilities during the period under study" (2011, p. 9).

Figure 12: Philips lamp. Source: *Zig-Zag* Magazine, August 12, 1916 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

Figure 13: "Herculex" electrical belt. Source: *Zig-Zag* Magazine, August 2, 1908 (taken from the inventory of the Hemeroteca Collection, Archivo Central Andrés Bello - Universidad de Chile).

Firstly, the need to integrate the theoretical contributions of STS approaches in the historical analysis of technological artifacts. More specifically, to introduce in researches the extension of technologies in various levels of analysis, such as transportation, cities, the environment, and advertising, allowing, in the light of this article, to insert the theoretical conception of technical confrontation and thus, to analyze more than one technology for the same historical period. For this purpose, I chose to introduce some theoretical contributions from the history of urban technologies, which open an enriching spectrum on the extensions of these types of techniques in cities. At

this point, my purpose is to make these theoretical options useful for future studies on the history of industrial design, technology, and consumption, since currently there are rather monographic works on the subject, instead of works that promote the connection of these historiographical aspects for the same technological process.

Secondly, and from a methodological perspective, although the advertising messages of the first electric lighting devices were used as a focus of study, the political views of municipal authorities and the technical discourse represented by the engineers who were present in those prior technical processes related to energy in Santiago, such as the electric tram, were also added. In this way, other visions of electricity were assembled to complement the analysis of advertising, which allows establishing, through the sources, that there was indeed an enormous difficulty in representing electricity due to the incipient extension of the network in Santiago, as mentioned above. This difficulty resulted in an almost natural association between electricity and the industrial productivity of the city and technological modernization, where the advertising of electric lighting and its 'fluidity' became important elements of what Santiago needed and would need for its urban progress. Finally, energy was described as a symbol of progress and development, which gave it a support that was very difficult to contradict, a *fin de siècle* discourse that was transmitted at least until 1950 (Zacarías, 2018).

Concluding, and linked to the methodological aspect described, it is worth mentioning that, although the article presents a local analysis of the introduction of a specific technology through its advertising, it sought to integrate, for the same period and technical electrification process, other capitals in Latin America. Underlying this is a conviction regarding the need to study the process from a regional perspective and thus encourage other technical experiences from Latin American cities to be integrated into technology studies carried out in Chile, seeking, for example, to promote studies of technological transfer throughout the continent.[12]

12 An excellent reference point for this is the book *Beyond Imported Magic: Essays on Science, Technology, and Society in Latin America* (Medina et al., 2014).

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This article is part of the research 'Electrificación, poder municipal e higiene: Visiones de la electricidad en la introducción del tranvía y alumbrado eléctrico en Santiago, (1890 – 1910)', thesis applying for the Master's degree in History, Pontificia Universidad Católica de Chile, 2018. These reflections were also part of the Fondecyt de Iniciación project 'El transporte y la contaminación ambiental. Un estudio histórico de controversias socio-técnicas en Santiago de Chile, 1902-1947', by the historian Rodrigo Booth, where I worked as a thesis student.

REFERENCES

ÁLVAREZ CASELLI, P. (2011). *Mecánica doméstica: Publicidad, modernización de la mujer y tecnologías para el hogar 1945-1970*. Ediciones UC.

BERMAN, M. (1988). *Todo lo sólido se desvanece en el aire: La experiencia de la modernidad* (A. Morales Vidal, Trans.). Siglo XXI.

BIJKER, W. E., HUGHES, T. P., & PINCH, T. (Eds.). (1987). *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. MIT Press.

BIJKER, W. E., & LAW, J. (Eds.). (1992). *Shaping Technology / Building Society: Studies in Sociotechnical Change*. MIT Press.

BOOTH, R. (2013). Higiene pública y movilidad urbana en el Santiago de 1900. ARQ, 85, 52-61. https://doi.org/10.4067/S0717-69962013000300009

BOUMAN, M. J. (1987). Luxury and Control: The Urbanity of Street Lighting in Nineteenth-Century Cities. *Journal of Urban History*, 14 (1), 7-37. https://doi.org/10.1177/009614428701400102

BRISEÑO SENOSIAIN, L. (2006). La solidaridad del progreso. Un paseo por la Ciudad de México en el Porfiriato. *Signos históricos*, 8(16), 186-207.

CHARTIER, R. (1992). *El mundo como representación: Estudios sobre historia cultural* (C. Ferrari, Trans.). Gedisa.

CORREA, M. J. (2014). Electricidad, alienismo y modernidad: The Sanden Electric Company y el cuerpo nervioso en Santiago de Chile, 1900-1910. *Nuevo Mundo Mundos Nuevos*. https://doi.org/10.4000/nuevomundo.66910

CORREA, M. J., & VALLEJO, M. (2019). *Cuando la hipnosis cruzó Los Andes: Magnetizadores y taumaturgos entre Buenos Aires y Santiago de Chile (1880-1920)*. Pólvora.

Decreto Ley 252. De instalaciones eléctricas, (1925). https://www.bcn.cl/leychile

DERIU, D. (2001). Opaque and Transparent: Writings on Urban Representations and Imaginations. *Journal of Urban History*, 27(6), 794-803. https://doi.org/10.1177/009614420102700607

DUSSAILLANT-CHRISTIE, J. (2019). Tiendas y consumo en Punta Arenas (1900-1917). Reflexiones sobre la publicidad como fuente histórica. *Magallania*, 47(1), 15-39. https://doi.org/10.4067/S0718-22442019000100015

ERRÁZURIZ, T. (2010). El asalto de los motorizados: El transporte moderno y la crisis del tránsito público en Santiago, 1900-1927. *Historia*, 43(2), 357-411. https://doi.org/10.4067/S0717-71942010000200002

ERRÁZURIZ, T. (2012). *La experiencia del tránsito. Motorización y vida cotidiana en el Santiago metropolitano, 1900-1931* [Doctoral Dissertation]. Pontificia Universidad Católica de Chile.

HUGHES, T. P. (1983). *Networks of Power: Electrification in Western Society, 1880-1930*. Johns Hopkins University Press.

IICH. (1902). *Anales del Instituto de Ingenieros de Chile. Editorial Instituto de Ingenieros de Chile. Santiago*. https://revistas.uchile.cl/index.php/AICH/issue/archive

LATOUR, B. (2008). *Reensamblar lo social: Una introducción a la teoría del actor-red* (G. Zadunaisky, Trans.). Manantial.

LEVY, E. (1997). The Aesthetics of Power: High-Voltage Transmission Systems and the American Landscape. *Technology and Culture*, 38(3), 575-607. https://doi.org/10.2307/3106855

LIERNUR, J. F., & SILVESTRI, G. (1993). *El umbral de la metrópolis: Transformaciones técnicas y cultura en la modernización de Buenos Aires (1870-1930)*. Sudamericana.

LOSSIO, J. (2003). *Acequias y gallinazos: Salud ambiental en Lima del siglo XIX*. Instituto de Estudios Peruanos.

MARTLAND, S. (2002). Cuando el gas pasó de moda: La elite de Valparaíso y la tecnología urbana, 1843-1863. *Revista EURE - Revista de Estudios Urbano Regionales, 28*(83), Art. 83.

MARTLAND, S. (2017). *Construir Valparaíso: Tecnología, municipalidad y Estado, 1820-1920*. DIBAM.

MCSHANE, C. (1979). Transforming the Use of Urban Space: A Look at the Revolution in Street Pavements, 1880–1924. *Journal of Urban History, 5*(3), 279-307. https://doi.org/10.1177/009614427900500302

MCSHANE, C., & TARR, J. A. (2011). *The Horse in the City: Living Machines in the Nineteenth Century*. Johns Hopkins University Press.

MEDINA, E., COSTA MARQUES, I. DA, & HOLMES, C. (Eds.). (2014). *Beyond Imported Magic: Essays on Science, Technology, and Society in Latin America*. MIT Press.

MEISNER ROSEN, C., & TARR, J. A. (1994). The Importance of an Urban Perspective in Environmental History: *Journal of Urban History, 20*(3), 299-310. https://doi.org/10.1177/009614429402000301

MELOSI, M. V. (2010). Humans, Cities, and Nature: How Do Cities Fit in the Material World? *Journal of Urban History, 36*(1), 3-21. https://doi.org/10.1177/0096144209349876

MUNICIPALIDAD DE SANTIAGO. (1895). *Boletín de Actas y Documentos de la Ilustre Municipalidad de Santiago*. Imprenta Barcelona.

MUNICIPALIDAD DE SANTIAGO. (1908). *Boletín de Actas y Documentos de la Ilustre Municipalidad de Santiago*. Imprenta Barcelona.

NAZER, R. (1996). *GASCO: 1856-1996: Historia de la Compañía de Consumidores de Gas de Santiago S.A.* Ediciones UC.

NAZER, R., COUYOUMDJIAN, J. R., & CAMUS GAYAN, P. (2005). *Cien años de energía en Chile: 1905-2005*. Ediciones UC.

NYE, D. E. (2019). *American Illuminations: Urban Lighting, 1800-1920*. MIT Press.

PALMAROLA SAGREDO, H. (2010). *Usos e imágenes en los procesos de asimilación de tecnología doméstica de baños, cocinas y electrodomésticos: Santiago de Chile, primera mitad del siglo XX* [Master's Thesis]. Universidad Nacional Autónoma de México. https://ru.dgb.unam.mx/handle/DGB_UNAM/TES01000657595

PALMAROLA SAGREDO, H. (2017). Tecnología doméstica y modernización del habitar, Santiago de Chile 1910-1950. In F. Pérez Oyarzún (Ed.), *Arquitectura en el Chile del siglo XX. Volumen 2: Modernización y Vanguardia 1930–1950*. ARQ.

PLOTNICK, R. (2012). At the Interface: The Case of the Electric Push Button, 1880–1923. *Technology and Culture, 53*(4), 815-845. https://doi.org/10.2307/41682743

PLOTNICK, R. (2018). *Power Button: A History of Pleasure, Panic, and the Politics of Pushing*. MIT Press.

PRUDANT, E. (2018). *Modernización urbana y movilidad: Itinerarios del tranvía en Santiago de Chile, 1857-1934* [Doctoral Dissertation]. Universidade de São Paulo. https://doi.org/10.11606/T.8.2018.tde-25102018-135900

PRUDANT, E. (2019). Del caballo a la electricidad: Imaginario ambiental y tecnológico en la transformación del sistema tranviario chileno a fines del siglo XIX. *Historia Crítica*, (74), 41-64. https://doi.org/10.7440/histcrit74.2019.03

Publicidad. (1919, junio 21). Zig-Zag, 748.

ROSE, M. H., & CLARK, J. G. (1979). Light, Heat, and Power: Energy Choices in Kansas City, Wichita, and Denver, 1900–1935. *Journal of Urban History, 5*(3), 340-364. https://doi.org/10.1177/009614427900500304

SARLO, B. (1997). *La imaginación técnica: Sueños modernos de la cultura argentina*. Nueva Visión.

SCHIVELBUSCH, W. (1988). *Disenchanted Night: The Industrialization of Light in the Nineteenth Century*. University of California Press.

SCHIVELBUSCH, W. (2005). *The Railway Journey: The Industrialization of Time and Space in the Nineteenth Century*. University of California Press.

STINE, J. K., & TARR, J. A. (1998). At the Intersection of Histories: Technology and the Environment. *Technology and Culture, 39*(4), 601-640.

TAFUNELL, X. (2011). La revolución eléctrica en América Latina: Una reconstrucción cuantitativa del proceso de electrificación hasta 1930 | The Electric Revolution in Latin America: A Quantitative Approach to the Electrification Process until 1930. *Revista de Historia Económica - Journal of Iberian and Latin American Economic History, 29*(3), 327-359. https://doi.org/10.1017/S0212610911000140

TARR, J. A. (2002). The Metabolism of the Industrial City: The Case of Pittsburgh. *Journal of Urban History, 28*(5). https://doi.org/10.1177/009614420202800500 1

TARR, J. A. (2014). Toxic Legacy: The Environmental Impact of the Manufactured Gas Industry in the United States. *Technology and Culture, 55*(1), 107-147. https://doi.org/10.1353/tech.2014.0008

TARR, J. A., & LAMPERES, B. C. (1981). Changing Fuel Use Behavior and Energy Transitions: The Pittsburgh Smoke Control Movement, 1940-1950: A Case Study in Historical Analogy. *Journal of Social History, 14*(4), 561-588.

YÁÑEZ, C. (2017). El arranque del sector eléctrico chileno. Un enfoque desde las empresas de generación, 1897-1931. In M. Llorca-Jaña & D. Barría T. (Eds.), *Empresas y empresarios en la historia de Chile: 1810-1930* (Vol. 1, pp. 175-193). Universitaria.

ZACARÍAS, Y. (2018). *Electrificación, poder municipal e higiene: Visiones de la electricidad en la introducción del tranvía y alumbrado eléctrico en Santiago, 1890-1910* [Master's Thesis]. Pontificia Universidad Católica de Chile.

ZACARÍAS, Y. (in press). La construcción de una ciudad cableada y la extensión del tranvía eléctrico: Electrificación, desarrollo técnico y nuevas configuraciones del espacio urbano. Santiago de Chile, 1890-1920. In S. Castillo & M. Mardones (Eds.), *La ciudad en movimiento. Estudios históricos sobre transporte colectivo y movilidad en Santiago de Chile, siglos XIX y XX*. Universidad Alberto Hurtado.